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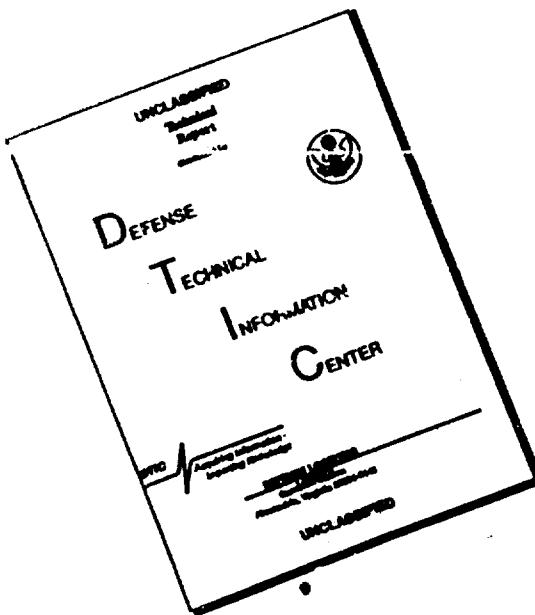
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Clinical Characteristics of the Tick Typhus of Northern Asia

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In the last 20 years Soviet researchers have conducted great works on the study of natural areas of tick rickettsiosis in various regions of our country. In particular, a natural center of the tick typhus was detected and studied in the Far East in a number of localities of the Khabarovsk region and the Primorsk (Mill, 1934-1935; Antonov and Neushtadt, 1936; work of the VIMM expedition, 1939).

Even though the clinical of tick typhus of the Far East was described by the works of Galperin, Rotenburg and Tsegankov (1941-1948), the clinical peculiarities of this rickettsiosis are still insufficiently familiar to a wide circle of practical doctors. Thus, a correct diagnosis was established in all but 18 of 62 patients during application of our clinical. Besides this, a knowledge of the course of the tick rickettsiosis is essentially important for the delimiting of it from cases of epidemical typhus fever which are still frequently encountered.

We studied the clinical course of the tick typhus in 62 patients in the years 1951-1954. Males among them were 33, females- 29, which indicates an almost similar morbidity of both sexes. Although this tick typhus affects all ages, an impressive part of the patients (22 of 62) were 36-45 years old.

The morbidity of the Northern Asiatic tick typhus in the group studied by us had a distinctly expressed seasonality: the basic mass of the patients became ill in the three summer months (June- August) and only 5 of the 62 patients contracted the disease in the spring (May) or in the fall (September and October). In this regard, the tick typhus of the Far East differs from an identical illness which is observed in several areas of Siberia and has

a maximum morbidity in May and a partial in June, with a full absence in the fall (Fridman and Fainshtein, Bocharova and others).

The number of infections each year depends, to a certain degree, on the meteorological factors. We were left with the impression that the morbidity of tick typhus is significantly increased during the hot and dry years.

All our patients had been in contact with nature preceding their infection, in wood or brush lands, or in villages which were located near wooded or brushy land. More than half of our patients were town-dwellers who went into the country to rest (fishing, berry picking, etc.) or to work. Among the tick typhus patients of the rural areas there were shepherders, milkers and road workers. Housewives who became ill were infected while working in their gardens.

Although we did establish that all the patients had been in the rural wood- or brush-land for short or lengthy periods, we did not find tick bites on all of them, nor did they report seeing, or removing from themselves, ticks (bites were found on 42).

According to our data the incubation period fluctuated from one to ten days, in a significant majority of the patients it was 3-5 days (15 of 27).

In a majority of the patients an abrupt beginning of the illness was noted, it was accompanied by chills and an abrupt rise in temperature during the first day to 38 and even 40 C. Simultaneously with the rise in temperature, there appeared intensive headaches, pains in the small of the back and in the joints, mainly in the lower extremities, muscular pains, loss of appetite and sleeplessness.

In 1/4 of the patients the development of the disease was more gradual with prodromal appearances in the later days of incubation; feverishness,

headaches and uneasy sleep. The temperature of these patients reached its maximum by the 3rd and 4th day of illness.

We were not able to establish any regular connection between the start and severity of the disease with the incubation period.

The length of the fever period fluctuated in wide levels- from 5-6 days to 17 days, but the cases with short, 5-6 days, courses and, in reverse, the cases with long courses were observed comparatively seldom; most of the cases were 7-8 days (11 cases) and 9-10 days (20 cases).

In 56 patients the temperature, having risen to 38-40 C. at the start of the illness, remained at this level through-out the entire fever period with only daily insignificant fluctuations which were reminiscent of the temperature curve during epidemical typhus. Only in singular cases was there any deviation from this observation. In two patients the temperature never passed 37.5 C during the entire illness.

Regarding the character of the fall of the temperature, we noted that if it lowered itself by the 8th day of illness, as it did in 15 patients, then the lowering was critical. In patients with longer periods of fever (9-17 days), the normalization of the temperature came about like an accelerated lysis in the course of 2-3 days. The temperature drop was, in most cases, accompanied by feverish sweating.

A characteristic sign of tick typhus is the reaction at the place of the tick bite- a so called initial affect- having the appearance of a slightly painful infiltrate with a size from 0.2 times 0.2 to 1 time 1 cm with necrosis in the center and covered with a dark-brown scab. We observed this initial affect in 42 of our patients. Characteristically, of those people having the initial affect, almost none of them remembered the time they were bitten. The resolution of the infiltrate and healing of the

necrosis ordinarily ended by the 10-12th day of illness. During a more extensive inflammatory process the illness had a pronounced character and the healing of the necrosis lasted to 15-18 days. For 5-6 weeks a blemish, from which the scab had been removed and which was slightly pigmented, remained and a scab was formed at the place of the necrosis.

We noted enlargement of the lymphatic glands in 32 patients along with the initial affect. It usually was a regional type and only in singular cases was it plural. The lymphatic glands attained the size of a walnut, they were not united with the adjoining tissue. Lymphangoitis was noted in 2 patients only and was, evidently, connected with a secondary infection.

In all patients there was hyperemia of the face and somewhat rarer- of the neck and trunk. There was hyperemia of the pharynx in 41 of the patients, in cases of illness with severe courses there appeared secreting hemorrhages. Puffiness of the face, infection of the sclera and hyperemia of the conjunctivas were also noted often.

An eruption was noted in all the patients without exception. In this regard our data disagree with the observations of Feoktistova who noted cases of tick typhus without an eruption. It appeared most often on the 2-5th day of illness, and only in singular cases did it appear on the 1st or later than the 5th day of illness (Table, appendix).

The eruption was mainly roseolus-papuloid. During a severe course of infection, several days after the eruption, a part of the roseola turned into petechiae. The rash remained for 3-5 days, then it turned pale and died away by the 10-18th day of illness (during the period of the temperature drop), leaving a brown colored pigmentation which disappeared after 2-3 days. An abundant eruption sometimes ended with peeling.

The rash, as a rule, was noted for its abundance and its localization on the chest, abdomen, back and extremities. The rash can also spread over the face, hairy part of the head, soles of the feet and palms.

In patients with a light or medium course of infection, disruptions of the cardio-vascular system were noted only by a slight decrease of the arterial pressure, moderate bradycardia and deadening of the heart tones. During a severe course there was a decreased arterial pressure to 85/40-80/50, and also an expressed lability and dicrotism of the pulse and extrasystole; during the course of the illness there was usually a deadening of the heart tones and sometimes dilatation of the left border of the heart.

Variations in the respiratory organs were noted only during severe courses of the tick typhus and were expressed as a catarrhal condition of the upper respiratory path (rhinitis, laryngitis and bronchitis). Only in one patient was there a development of a roentgenologically proven pneumonia.

Loss of appetite and constipation during the entire course of the fever period of the illness were noted in almost all the patients; the tongue usually remained wet, but it became covered with a white, thin coating; in some of the patients with severe courses the tongue became dry and covered with fissures. The liver and spleen were moderately swelled at the height of the illness in ~~all~~ 1/5 of the patients only.

In regard to the kidneys there was a decrease in the diurea in half of the cases at the height of the illness, irregardless of the great quantity of water which was taken. The specific gravity of the urine was ordinarily high, the reaction acidic; during a severe course of tick typhus a small albuminuria was noted. In the first days of apyrexia the diuria increased, simultaneously the specific gravity of the urine decreased and the albumen disappeared.

The patients suffered certain symptoms of affection of the central and vegetative nervous systems, these were expressed by headaches, the intensity of which grew respectively with the severity of the illness.

At the climax of the illness 25 patients with severe courses suffered psychiatric retardation, and 4 patients suffered delirium during the night. Excitation and euphoria were registered in singular cases. In one case symptoms of meningism were observed. In all patients there was noted sleeplessness or uneasy sleep.

Radiculitis of the small of the back was noted in three patients over the entire fever period.

During the setting of reactions of agglutination with three protein antigens ( $X_19$ ,  $X_2$ ,  $X_k$ ) the highest titer was with proteus  $X_2$ , the titer with proteus  $X_19$  was significantly lower, proteus  $X_k$  did not agglutinate with the serums of our patients. In this regard our observations disagree with those of Galperina, who was unable to obtain a positive serological reaction with protein antigens in patients of tick typhus of the Far East, Feoktistova, who noted the greatest positive serological reactions with proteus  $X_19$ , and also with Fainshteina, who registered positive reactions of agglutination to the proteus  $X_19$  in 100 % of the patients on the 8-11th day of illness during tick typhus in the Krasnodarsk region.

We were unable to note any regular morphological variations in the blood during the Northern-asiatic tick typhus.

#### Conclusions

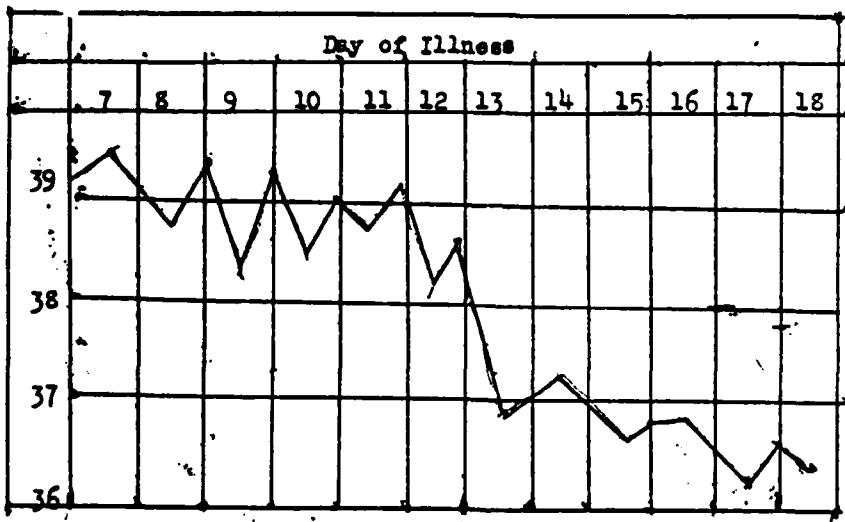
1. The infections of Northern-asiatic tick typhus observed by us in the Far East distinguished themselves by their seasonality; it appeared in the beginning of May and terminated in October; the maximum number of infections came in the three summer months.

2. The infections were connected with travel to rural wooded or brushy land; of 62 patients 42 bore tick bites.

3. The incubation period was 3-5 days in a majority of the cases, but was shorter, 1 day, or longer, 10 days. The length of the incubation period did not effect the severity of the illness.

4. The clinical course differed by a high-qualitive, and characterized itself with, a sudden commencement, fever with a duration of 9-10 days a greater part of the time, hyperemia of the face, characteristic, chiefly roseolus-papuloid rash which was more pronounced on the buttocks and thighs.

5. The greatest titer of agglutination was obtained during serological reactions with proteus X2; with proteus X19 the titer, as a rule, was significantly lower.



Periods of appearance and disappearance of rash during Northern-asiatic tick typhus in 1951-1954 in the Far East.

Day of illness	Eruption							Total	Disappearance							Total			
	1	2	3	4	5	6	7		8	9	10	11	12	13	14	15	16	17	
Number ill	1	11	25	11	8	1	3	2	62	4	4	4	8	6	11	6	6	13	62